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Novel Multipurpose Timer for Laboratories

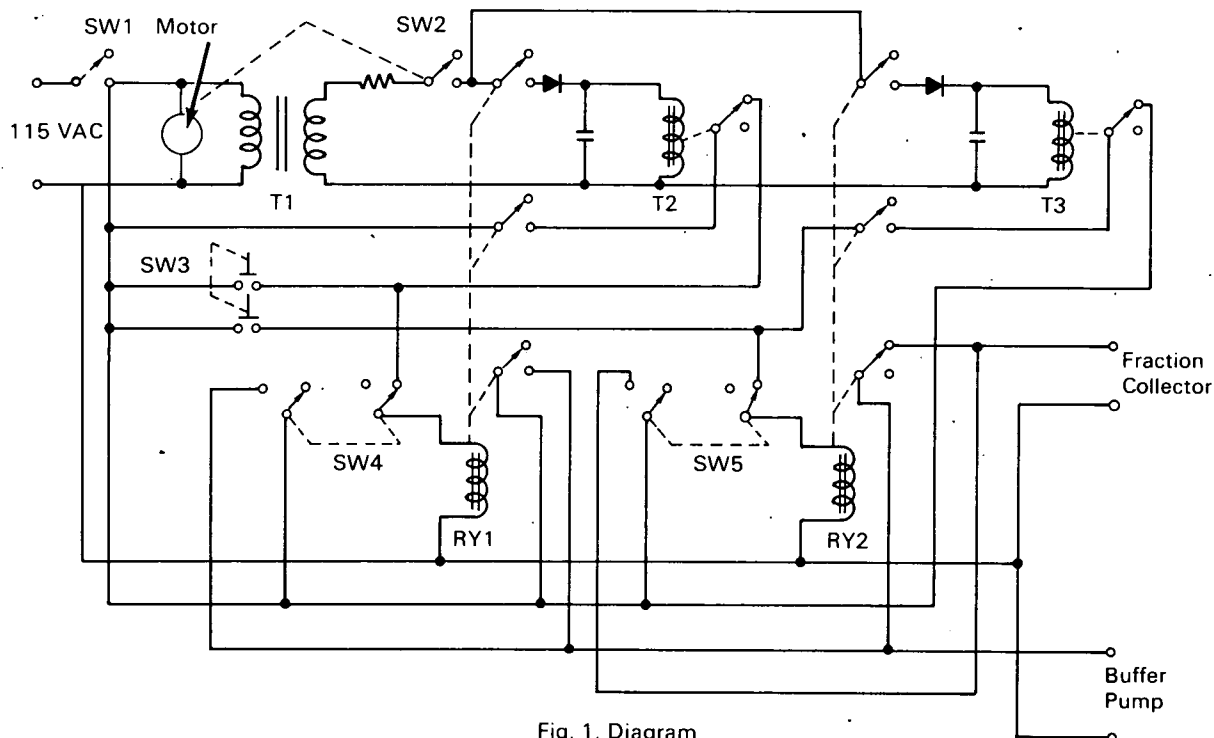


Fig. 1. Diagram

The problem:

To develop a more accurate timer for control of laboratory equipment. With no timers now commercially available can a 4-to-24 hour period be divided more precisely than within 15 minutes. The need for such a timer arose during studies of isotopically labeled amino acids on ion-exchange columns; it was necessary to divide the emerging peak into 20 or 30 fractions collected at intervals of 0.5 to 1.0 minute. Since the volume of buffer required for the start of the peak was never less than 100 ml, collec-

tion of all the intervening fractions would have required the capacity of the fraction-collector to be 8 to 10 times greater than that of any available.

The solution:

A newly constructed multipurpose digital delay timer simultaneously controls both the buffer pump and this fraction-collector; timing and control may be in 30-second increments for up to 15 hours.

This dual timer and controller has proved to be versatile in its application, simple to operate, and

(continued overleaf)

remarkably free of mechanical or electronic difficulties. Besides providing the desired precision of time, it effects considerable economy in the use of glassware and scintillation vials.

How it's done:

A timing pulse is generated every 10 seconds by a 6-rpm synchronous clock motor having a small bar magnet mechanically linked to its shaft (fig. 1). The field of the rotating magnet activates a magnetically sensitive reed switch (SW2) that pulses Sodeco registers T2 and T3.

The Sodeco register is an electromagnetic predetermining device that provides visible digital readout and control in a single unit. At the end of a predetermined run, the counter actuates a contact that ends the operation. The counter can be preset manually from 1 to 9999; depression of its manual reset button returns it to its initial presetting. Two models are available having different resolving times: 10 and 25 counts per second. Push button SW3 starts the timing sequence by applying power to relays RY1 and RY2. Both relays control continuity through the driving power supply, and are series-locked through both their own contacts and the predetermining register contacts; they also control power to the output circuits. As each register is pulsed, it counts down to zero from its preset digits before deactivating RY1 and RY2; the power control of these relays is now reversed. Switch 4 and SW5 are manual bypass switches for RY1 and RY2.

The basic time increment, of this simple, rugged, reliable timing unit, can be altered at will by substitution of the appropriate low-speed motor. The

Sodeco registers permit the total interval to be specified as a multiple of the basic time unit by simple dialing of the numbers into the register. The modular nature of the registers, together with a common timing impulse for all registers, permits design of a wide variety of logic sequences in which each step is separated by a precisely determined yet completely flexible interval.

Notes:

1. This device would be useful for reactions, titrations, and chromatography procedures requiring accurate timing and control.
2. Manufacturers and users of laboratory equipment may be interested.
3. Inquiries concerning this innovation may be directed to:

Office of Industrial Cooperation
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439
Reference: B69-10410

Source: W. J. Eisler and P. D. Klein
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Patent status:

Inquiries about obtaining rights for commercial use of this innovation may be made to:

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